



HEALTH CARE UTILIZATION OF PERSONS WITH DISABILITIES

in Cambodia

Based on the Cambodia
Demographic and Health Survey
2014





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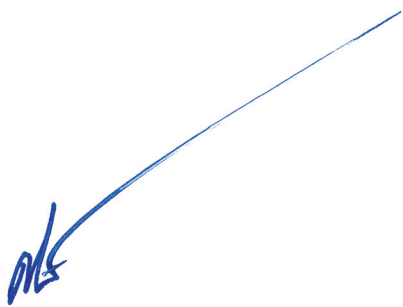
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FOREWORD

This analysis of health care utilization of persons with disabilities in Cambodia is based on the 2014 version of the Cambodia Demographic and Health Survey, which adopts the standardized measure of disability known as the Washington Group Short Set of Questions on Disability. This secondary analysis was funded by the Australian Department of Foreign Affairs and Trade (DFAT) through the Disability Rights Initiative Cambodia (DRIC) programme, jointly implemented with the United Nations Development Programme (UNDP), United Nations Children's Fund (UNICEF) and World Health Organization (WHO).

This report represents the commitment and efforts of Cambodia to provide a socioeconomic and health status profile of the Cambodian population with disabilities as an additional contribution to the national disability statistics. In addition, it aims to inform the implementation of the National Disability Law and the National Disability Strategic Plan (NDSP). Last but not least, it provides recommendations to reduce the financial and nonfinancial barriers to better access to health care for persons with disabilities.

We are confident this report will be useful to the line ministries, development partners, nongovernmental organizations, disabled people's organizations, policy-makers, programme implementers and researchers in their efforts for improved health for all persons with disabilities.



Hang Lina

Delegation of the Royal Government of Cambodia in-charge of Director General of the National Institute of Statistics



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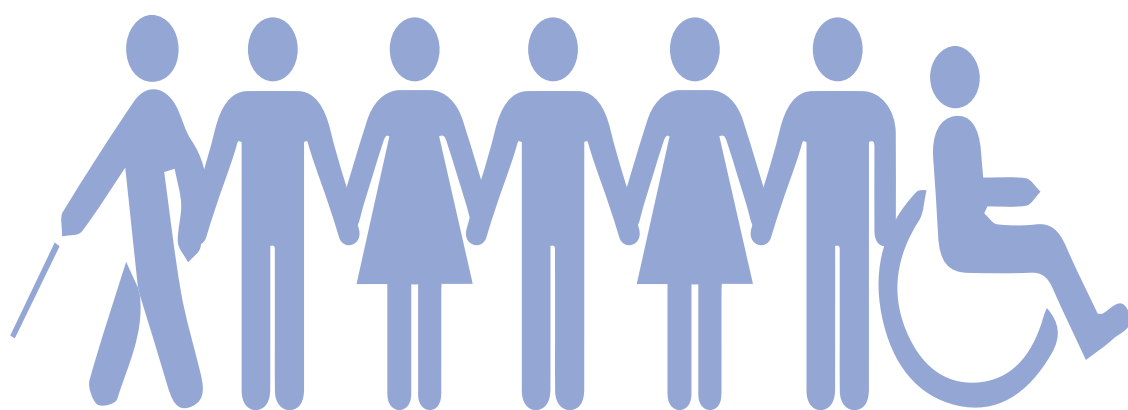
Regional Director for the Western Pacific World Health Organization

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EXECUTIVE SUMMARY



The World Health Organization has recently highlighted access to health and rehabilitation services as both a human rights and a development issue. There is a growing body of evidence to suggest that persons with disabilities experience both a high need for health care and a low capacity to pay, compared to persons without disabilities. This combination presents a serious challenge to health equity and universal health coverage goals of providing access to all the services that people need without causing financial hardship.

This report presents findings on the health care utilization of persons with disabilities in Cambodia. It has been generated from the 2014 version of the Cambodia Demographic and Health Survey, which adopts the internationally standardized measure of disability known as the Washington Group Short Set of Questions on Disability. The measure collects information on difficulty in functioning in basic activities across six functioning domains, with the aim of identifying persons who experience functioning difficulty that may limit or restrict their participation in society.

According to the 2014 Cambodia Demographic and Health Survey, 9.5% of the Cambodian population experience at least some degree of difficulties in performing basic functions, and 2.1% experience a lot of difficulties and cannot fully perform basic functions. Some of the key findings of the study were as follows:

- ❖ Persons with disabilities were more than twice as likely to be ill or injured, report a severe health condition if ill or injured, and seek treatment or advice as persons without disabilities, in the last month.
- ❖ Persons with disabilities on average spent 3–4 times the amount on total health-care-related treatment and travel costs compared to persons without disabilities, depending upon the degree of disability, in the last month.
- ❖ At health care providers, persons with disabilities spent approximately 30% more on treatment, and double on associated travel costs than persons without disabilities, in the last month.
- ❖ By two measures of poverty, including a calculated measure of household wealth and participation in the Identification of Poor Households (IDPoor) programme, persons with disabilities experienced a rate of poverty approximately 4–6% higher than persons without disabilities.
- ❖ Persons with disabilities were less likely to draw upon income and savings and more likely to draw upon support from relatives in order to finance health-care-related expenses than persons without disabilities.

Overall, the findings suggest that persons with disabilities in Cambodia experience higher needs and lower capacity to pay for health care than the population without disabilities. Under current National Disability Law, only persons identified as living with a severe disability who are poor are entitled to social protection support. This is a concern, since results indicate that both the use of and capacity to pay for health care differ little by the degree of disability, using a moderate to severe measure and a severe measure (Washington Group Short Set of Questions on Disability). Currently, three quarters of the estimated population with disabilities in Cambodia remain uninsured. On grounds of health equity there is a case for expanding coverage of current social protection support for persons with disabilities.

While this study finds higher utilization of health care among persons with disabilities compared to persons without disabilities, the findings also suggest a range of barriers to access to health care for those with disabilities that are consistent with findings from an earlier qualitative study in Cambodia (Kleinitz et al., 2012). We find evidence of a lower capacity to pay for health care due to higher rates of poverty, lower educational achievements and a higher likelihood of drawing upon external support to finance health care. We do not find any significant statistical effect of disability on health care utilization according to whether the person lives in a rural or urban area or in a poor or nonpoor household, when controlling for other influencing factors.

The Royal Government of Cambodia has the legal and institutional arrangements in place to improve access to health care for persons with disabilities. The following are put forward as considerations to reduce the financial and nonfinancial barriers to health care for persons with disabilities in Cambodia:

- ❖ Expand eligibility for the Health Equity Fund card under the IDPoor programme to persons with moderate to severe disabilities, irrespective of poverty status, to assist with health-related expenditure incurred at public health facilities.
- ❖ Expand eligibility for the Disability Pension to include persons with moderate to severe disabilities, irrespective of poverty status, to assist with health-care-related expenditure. Consideration should be given to increasing the monthly amount of the Pension commensurate with health care and other disability-related costs.
- ❖ Expand the capacity of the health care system to facilitate the needs of persons with disabilities and improve service quality through raising awareness among health service providers on the rights and needs of persons with disabilities to health care, and improving access to specialized rehabilitation services, assistive devices and medication for persons with disabilities.
- ❖ Expand understanding and awareness among persons with disabilities themselves on their rights to health care and entitlements under social health protection. Expand inclusive education and special education policies further to address user knowledge and financial barriers to health care.
- ❖ Expand physical access features of health facilities and the availability of reliable, affordable and accessible transportation for persons with disabilities to improve access to health facilities.
- ❖ Expand community awareness on the rights and capabilities of persons with disabilities to address attitudinal barriers so that those with disabilities are provided with opportunities to access health care and participate as equal and valued members of society.

According to the *World Report on Disability*, over 1 billion people, or 15% of the world's population, are living with some form of disability, with prevalence rates predicted to increase due to ageing populations and increases in noncommunicable disease (World Health Organization and World Bank, 2011). Worldwide, persons with disabilities experience lower living standards and economic and social participation than those without disabilities (World Health Organization and World Bank, 2011).

The understanding of disability has evolved over time. In 2001 the World Health Assembly endorsed the International Classification of Functioning, Disability and Health (ICF) and in 2006 the United Nations adopted the Convention on the Rights of Persons with Disabilities (CRPD). Both of these define disability as the functional outcome of the interaction between someone with an impairment (as a result of a health condition) and their environment. This definition has had significant implications for the measurement of disability, with new tools now being utilized.

There is a growing body of research indicating that persons with disabilities require more goods and services, hence incurring higher economic costs to achieve the same level of functioning as able-bodied people (Zaidi & Burchardt, 2005; Sen, 1984; Mont & Nguyen, 2011; Loyalka et al., 2014; Haveman & Wolfe, 2000). Given that a health condition is a core component of the disability definition, it is not surprising to find that, across a range of countries, people with disabilities experience higher needs for health care services than those without disabilities (World Health Organization and World Bank, 2011). While people with disabilities experience higher health care needs for services and support, they also have a relatively low capacity to pay. Across every society, persons with disabilities and their families are more likely to be poorer, have lower educational attainments and lower employment rates (World Health Organization & World Bank, 2011; Mitra, Pasasac & Vick, 2013; Mont & Nguyen, 2011). The combination of high needs and low capacity to pay for health care services is a serious policy concern. It puts people with disabilities at risk of catastrophic health expenditure, poverty-inducing health care payments or foregoing much needed health care treatment, which will exacerbate health conditions, disability and social and economic exclusion. There is a growing awareness that failure to address the health and other needs of persons with disabilities may jeopardize the achievement of Sustainable Development Goals (United Nations General Assembly, 2015).

Equity in health requires that everyone can access health services of good quality and that services are provided according to need so that everyone has a fair opportunity to attain their full health potential (Whitehead, 1992). The concept of health equity is embedded in the widely adopted notion of universal health coverage (UHC). Guided by principles of providing access to all the services that people need without causing financial hardship, UHC is now a key policy goal of many low-

and middle-income countries (LMICs). It is widely recognized as essential to enhancing health, social cohesion and sustainable human and economic development (World Health Organization, 2010). The provision of available, accessible and affordable health care for persons with disabilities represents a significant global challenge.

The Royal Cambodian Government has enacted the rights of persons with disabilities. In July 2009 it introduced an inaugural national disability law, the *Law on the Protection and the Promotion of the Rights of Persons with Disabilities* (Kingdom of Cambodia, 2009). The Law aims, among other things, to develop programmes for physical and mental rehabilitation to enable persons with disabilities to fulfil their potential and fully exercise their capacities and talents in society. Furthermore, one key objective of the *National Disability Strategic Plan 2014–2018* (NDSP) is to provide persons with disabilities with equal access to quality health services as well as physical and mental rehabilitation. Persons with severe disabilities who are poor are identified as being entitled to preferential policies on health care services, treatments and physical rehabilitation, plus monetary support to assist with disability-related expenses.

This report aims to generate evidence on inequalities in the utilization of health care by disability status in Cambodia. The study adopts the 2014 round of the Cambodia Demographic and Health Survey, which includes the internationally standardized Washington Group Short Set of Questions on Disability. The report provides a detailed study of disability prevalence in the country using a contemporary international measure of disability. It provides a socioeconomic and health status profile of the disabled population as an additional contribution to national disability statistics. Health care utilization is analysed using both descriptive and multivariate methods of analysis to provide a comprehensive analysis of the association between disability and health care utilization.

The report aims to inform the implementation of the National Disability Law and the Strategic Plan. More widely, the report contributes to the limited evidence base on the health-care-seeking behaviours of persons with disabilities. Research on health care utilization of persons with disabilities is limited, with the majority of research being confined to high-income countries. Potential reasons relate to the lack of disability data and statistical complications in modelling health care expenditures (Mitra, 2013). In this report, we apply an appropriate two-part model that is adjusted for the complex survey design of the Cambodia Demographic and Health Survey. The results are provided for persons with disabilities generally, as well as across key personal characteristics including gender, age, urban or rural location and poverty status. One notable contribution of the report to the literature is the modelling of health care utilization among persons with and without disabilities over the life cycle.

2

BACKGROUND ON DISABILITY IN CAMBODIA

A history of civil and regional conflicts and its current status as a low-income country place its population at increased risk of disability. Cambodia experienced nearly three decades of civil conflict from the 1970s through to the end of the 1990s, with a period of genocide by the Khmer Rouge from 1975 to 1979. This was characterized by starvation, forced labour, untreated disease, torture and execution (Dy, 2007). Today, the country has among the highest concentration of landmines in the world, and significant unexploded ordnance remains in the eastern and central regions as a result of US Air Force bombing campaigns over the period 1965–1975 (Merrouche, 2011). The conflict and remaining unexploded ordnance still contribute to disability, including loss of limb and hearing and vision impairments. Cambodia also has a high level of mental health conditions, such as post-traumatic stress, depression and suicide, which are associated with postconflict populations (Royal University of Phnom Penh, 2012).

Disability may arise as both direct and indirect effects of the conflict through contact with violence or effects on human health associated with poverty and malnutrition and the breakdown in public services and infrastructure such as health services and sanitation (Ugalde, Richards & Zwi, 1999). Conversely, the death of an estimated one quarter of the population in the 1970s has dramatically affected the demographic profile of the country (de Walque D., 2006, 2005). The proportion of middle-aged people (35–44 years) in Cambodia as birth cohorts born in the 1970s is lower than would otherwise be expected under normal population growth models (National Institute of Statistics, Directorate General for Health & ICF International, 2015). Because disability is correlated with age, excess mortality during the conflict period puts downward pressure on current population disability prevalence.

Other trends affecting disability are increased road traffic crashes and injuries at construction sites. The country has experienced a doubling of traffic fatalities over the decade 2005–2014, and in 2014 it is estimated that over 2000 fatalities and over 6000 major injuries occurred on the roads.¹ In line with global trends, Cambodia is also experiencing increases in noncommunicable disease. The rising prevalence of cardiovascular disease increases disabilities associated with conditions such as stroke, paralysis and limb amputations.

Cambodia's economy has made significant progress in recent times. It has changed from a low-income country to a middle-income one. Its per capita gross domestic product (GDP) is approximately US\$ 1218 (National Institute of Statistics, Directorate General for Health & ICF International, 2015). Poverty decreased significantly, to approximately 14% of the population, in 2014. However, significant inequalities in living standards exist between urban and rural areas where some 81% of

¹ Cambodia National Road Safety Committee, 2014 Annual Report, Kingdom of Cambodia.

the population reside. Child malnutrition remains high, with an estimated one third of the child population stunted. Private pharmacies remain the first health care provider of choice for the majority of Cambodians. The vast majority of the population is uninsured, and actual out-of-pocket health expenditures remain high. Such factors relating to poverty and the accessibility of quality, affordable health care raise the risk for disabilities (World Health Organization & World Bank, 2011).

The prevalence rates of disability indicated from previous national household-level surveys range from 1% to 6%. These rates are inconsistent with what would be expected from a low-income country with a history of civil conflict (for a detailed review, refer to Hasan, 2014). The 2008 General Population Census indicated a prevalence rate of 1.4% of the Cambodian population as disabled from the instruction, “if the person is physically or mentally disabled give the appropriate code” according to categories of vision, speech, hearing, movement and mental capacity (National Institute of Statistics, Ministry of Planning, 2010). The disability categories were defined in terms of medical impairments, e.g. a person who lacked limbs or was unable to use the limbs normally. Measures that adopt a medical impairment measure of disability, as opposed to a functional measure are associated with low levels of prevalence (National Institute of Statistics, Ministry of Planning, 2009; Mont, 2007; Palmer & Harley, 2011). More recently, the Cambodia Socio-Economic Surveys have used variations of the Washington Group Questions, and disability prevalence has been identified in up to 6% of the population.



3

DESCRIPTION OF THE SURVEY AND DEFINITION OF DISABILITY

3.1 SURVEY DESCRIPTION

The 2014 Cambodia Demographic and Health Survey (CDHS) is the fourth round of the Survey, and provides nationally representative health information (National Institute of Statistics, Directorate General for Health & ICF International, 2015). The primary objective of the CDHS is to provide the Ministry of Health, Ministry of Planning, and other relevant institutions and users with updated and reliable data on infant and child mortality, fertility preferences, family planning behaviour, maternal mortality, utilization of maternal and child health services, health expenditures, women's status, and knowledge and behaviour regarding HIV/AIDS and other sexually transmitted infections. The 2014 version includes an inaugural disability module modelled on the Washington Group Short Set of Questions on Disability (described below). The 2014 CDHS was conducted by the Directorate General for Health of the Ministry of Health and the National Institute of Statistics of the Ministry of Planning. Support was provided by an executive committee and technical committee comprised of national and international partner organizations.²

The 2014 CDHS, like its predecessors in 2000, 2005 and 2010, followed a two-stage stratified cluster design (National Institute of Statistics, Directorate General for Health & ICF International, 2015). Stratification was based on rural and urban areas, with census enumeration areas selected using a probability proportionate to the number of households for each stratum in the first stage. In the second stage, 24 households were selected from every urban cluster and 28 from every rural cluster through equal probability systematic sampling. Small areas and urban areas were oversampled, which was taken into account in the construction of the probability sample weights. The total sample size was 15 825 households (74 112 individuals), with a sample response rate of 99%. Each household completed a questionnaire, with the person with most knowledge of the household responding on behalf of all members. Separate questionnaires were administered to female and male household members aged 15–49 years. For the purpose of this report, we use information collected in the household questionnaire to elicit information on the all-aged sample.

3.2 DEFINING DISABILITY

The Convention on the Rights of Persons with Disabilities defines disability as a result of the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others. This definition is

² They consisted of representatives from the Ministry of Health, the Ministry of Planning, the National Institute of Statistics, the US Agency for International Development (USAID), the Australian Department of Foreign Affairs and Trade (Australia-DFAT), the United Nations Population Fund (UNFPA), the United Nations Children's Fund (UNICEF), the Japan International Cooperation Agency (JICA), and the Korea International Cooperation Agency (KOICA). Funding for the survey came from USAID, Australia-DFAT, UNFPA, UNICEF, JICA, KOICA and the Health Sector Support Programme – Second Phase (HSSP-2). Technical assistance was provided by ICF International.

in line with the International Classification of Functioning, Disability and Health (ICF), suggesting that disability is neither a purely medical nor a purely social condition. These definitions reflect a conceptualization of disability that places it on a spectrum of functioning difficulties. Hence disability measurement must reflect this spectrum with necessary cut-off points on it. The CDHS 2014 adopted the Washington Group Short Set of Questions on Disability, which was inspired by the ICF. The Washington Group Questions comprises six questions according to six functional domains – seeing, hearing, walking, remembering or concentrating, self-care and communicating – along an ascending scale of difficulty of “none”, “some”, “a lot” and “cannot do at all” (Box 1 page 7).

Contemporary understanding of disability is therefore broader than a medical and individualized condition, but is seen as a complex interaction between people’s impairment and the lived environment which limits activities and participation (Thomas, 2005). For example, a person may have an upper body mobility impairment, but it is the extent to which they can dress or transport themselves and participate in education or employment that determines disability. Furthermore, a relatively minor impairment, such as short-sightedness, may be associated with a significant disability depending on the environment, such as an environment where spectacles are not easily accessible, resulting in the discontinuation of schooling or a job that demands a reasonable level of literacy. Hence two people with the same impairment may have completely different levels of disability, depending upon the environment.

The Washington Group Short Set of Questions on Disability focuses on measuring the level of functioning difficulty experienced in performing basic actions, rather than the existence of a health condition or impairment. The measure is necessarily brief as it was designed for use in national census or household surveys, and has undergone extensive cognitive and field-testing in over 50 country settings (Madans, Loeb & Altman, 2010). The measure was designed primarily for international comparison. Hence it includes questions on basic activities only, rather than on more complex activities that are influenced by cultural and socioeconomic factors in the surrounding environment. Equalization of opportunities formed the conceptual framework through which the measure was developed. The intention was that the measure could be tabulated across other survey modules such as education, employment and health care access to determine inequalities in participation between persons with and without activity limitations.

The Washington Group on Disability Statistics recommends that persons with disabilities be defined as those who experience a lot of difficulty or cannot operate at all in at least one of the six functional domains (Box 1 page 7). This may be interpreted as a moderate to severe measure of disability. In this report we include two alternative measures of disability of differing degrees of functioning to examine inequalities according to different thresholds of disability. We adopt a general measure of disability as (i) persons who experience at least some difficulty in any of the six functioning domains which we interpret as a moderate to severe measure of disability referred throughout the report as “any disability” or “persons with disabilities”, and the recommended measure of (ii) persons who experience a lot of difficulty or cannot operate in at least one of the six functioning domains, referred to throughout the report as “persons with severe disabilities”. The sample is limited to persons aged 5 years of age or older, as per the question.

Box 1. Disability questions contained in the Cambodia Demographic and Health Survey 2014 for persons aged 5 years or older

1. Do you have difficulty seeing, even if wearing glasses?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.

2. Do you have difficulty hearing, even if using a hearing aid?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.

3. Do you have difficulty walking or climbing steps?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.

4. Do you have difficulty remembering or concentrating?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.

5. Do you have difficulty with self-care such as washing all over or dressing?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.

6. Because of a physical, mental or emotional health condition, do you have difficulty communicating (for example, understanding others or others understanding you)?

- a. No – no difficulty
- b. Yes – some difficulty
- c. Yes – a lot of difficulty
- d. Cannot do at all.



4.1 DISABILITY PREVALENCE

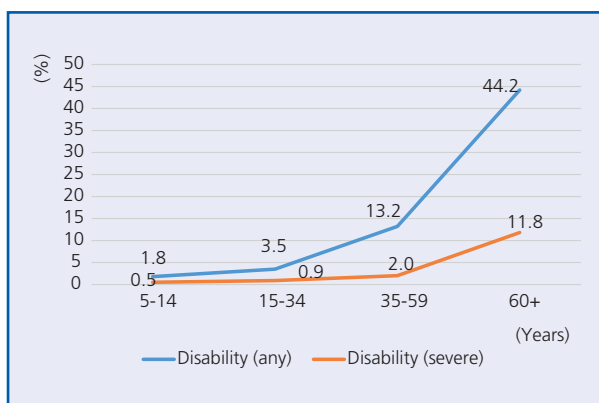
Disability prevalence in Cambodia for any level of functioning difficulty is 9.5% (Table 1). The rate of severe functioning difficulty experienced among the Cambodian population is significantly lower, at 2.1%. By gender, a 2% higher rate of disability is experienced among the female population compared with the male population (10.4% versus 8.4%), a pattern that is consistent with a higher level of functioning difficulty. By location of residence, a 1% higher rate of disability is recorded among the rural compared with the urban population (9.6% versus 8.6%). The rate of severe disability is similar across rural and urban locations (2.1% versus 2.2%). The pattern of gender differences in reported disability remains consistent across rural and urban areas, with a higher prevalence reported among the female population.

Table 1. Disability prevalence (%), by severity, gender and location of residence

	National			Rural			Urban		
	Total	Female	Male	Total	Female	Male	Total	Female	Male
Disability (any), %	9.5	10.4	8.4	9.6	10.6	8.5	8.6	9.2	7.9
Disability (severe), %	2.1	2.3	1.9	2.1	2.3	1.9	2.2	2.3	2.1

Disability prevalence in Cambodia is highly variable according to age (Fig. 1). Across all levels of functioning difficulty, the prevalence rate ranges from 1.8% for persons aged 5–14 years to 44.2% for persons aged 60 years and above. Disability begins to increase dramatically in middle age, from 3.5% for persons aged 15–34 years to 13.2% for persons aged 35–59 years. The positive association between reported disability status and age is even stronger for persons reporting severe functioning difficulties, with an approximate sixfold increase from the middle aged to elderly age brackets (2.0% versus 11.8%).

Fig. 1 Disability prevalence, by age and severity



There is also great variation in reported disability prevalence by type of functioning difficulty. The differences are most pronounced, and the pattern remains consistent in middle and old age. Vision difficulties are most commonly reported, followed by walking and concentrating difficulties, then hearing difficulties, and communicating and self-care difficulties (Fig. 2). It is interesting to observe that the type and pattern of difficulties reported differ among persons with severe functioning difficulties (Fig. 3). For older people (60 years and above), walking and vision difficulties are most common, followed by concentrating, hearing, self-care and communicating. Until middle age, communicating and concentrating difficulties remain the most commonly reported functional difficulties, and mobility difficulties remain the least commonly reported.

Fig. 2 Disability (any) prevalence by type of functioning difficulty

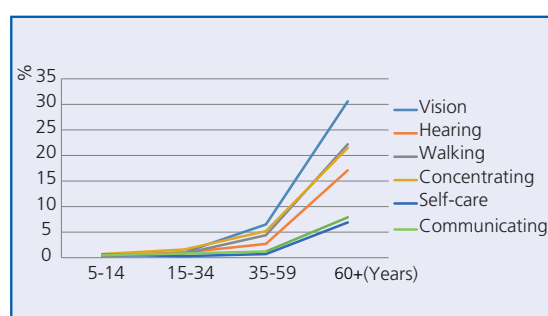
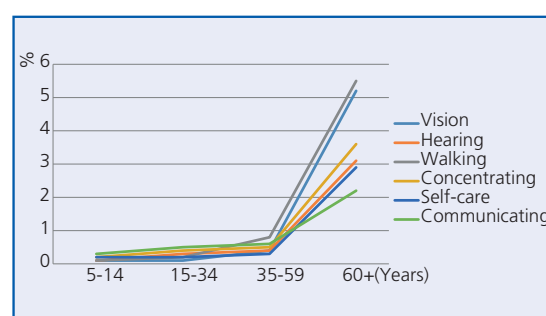


Fig. 3 Disability (severe) prevalence by type of functioning difficulty



4.2 SOCIOECONOMIC PROFILE OF PERSONS WITH AND WITHOUT DISABILITIES

Descriptive statistics for the disabled and nondisabled populations in Cambodia are presented in Table 2. Persons with disabilities, on average, are approximately double the age of persons without disabilities (54 years versus 28 years). Approximately 5% of the disabled population are aged 5–14 years, whereas 44% are 60 years of age or above, compared with 27% and 6% respectively for those without disabilities. The prevalence of severe disability is much higher among persons with disability who are 60 years of age or over (52%).

Persons with disabilities are more likely to be female than male (57% versus 43%) and at a proportion higher than those without disabilities (51% versus 49%). Among persons 15 years of age and older, those with disabilities are less likely to be married (63% versus 66%), yet are significantly more likely to be widowed (25% versus 6%) due to the strong age gradient of disability. Differences are higher for persons with severe disabilities. There is little difference in the divorce rate between persons with and without disabilities.

Educational achievements are significantly lower for the disabled population. Among children of school age (defined as 6–14 years), 70% of children with disabilities were attending school in the academic year prior to survey, compared with 90% of children without disabilities. For the all-aged sample, 35% of persons with disabilities had received no formal education compared with 14% of the nondisabled population. A similar proportion of the disabled population had completed primary school to the nondisabled population (47% versus 52%). Yet persons with disabilities were approximately half as likely to complete secondary school as those without disabilities (16% versus 30%). On average, persons with disabilities experienced 1.6 years, or one third, less education than those without disabilities.

Inequalities in educational achievements are notably higher for persons with severe disabilities. Approximately one half of children with severe disabilities (48%) attended school in the year prior to survey. Approximately one half of the all-aged sample of those with severe disabilities had completed no formal education (49%). Across all education levels, persons with severe disabilities reported significantly lower completion rates, and had completed approximately half the number of years of education compared with persons without disabilities.

There are also differences in household characteristics among disabled and nondisabled subpopulations in Cambodia. Persons with disabilities live in smaller households (5.1 versus 5.5 members) and are more likely to be in the poorest per capita wealth quintile (25% versus 21%). This rate of poverty, as measured by a collection of household assets, housing characteristics and access to services, is slightly higher among persons with severe versus non-severe disabilities (27% versus 25%). The wealth index poverty rates by disability status are very similar to those determined by identification in the IDPoor programme, with slightly higher rates among people with different degrees of disabilities (27% and 29%). There is little difference in geographic location by disability status, with the overwhelming majority of persons with disabilities living in rural areas (85%).

Table 2. Socioeconomic profile of persons with and without disabilities

	Persons without disability	Persons with disability	Persons with severe disability
Age (years)	28.2 (p= 0.127)	53.7 (p= 0.491)	56.4 (p= 0.847)
Age category (percentage)			
5 to 14	27.3 (p= 0.003)	4.7 (p= 0.003)	6.2 (p= 0.008)
15-34	41.1 (p= 0.003)	14.3 (p= 0.008)	16.1 (p= 0.012)
35-59	25.8 (p= 0.003)	37.5 (p= 0.009)	26.0 (p= 0.018)
60+	5.7 (p= 0.001)	43.5 (p= 0.011)	51.7 (p= 0.019)
Sex (percentage)			
Male	48.7 (p= 0.002)	42.9 (p= 0.007)	43.7 (p= 0.015)
Female	51.3 (p= 0.002)	57.1 (p= 0.007)	56.3 (p= 0.015)
Marital status (if age 15 or over) (percentage)			
Never married	26.3 (p= 0.004)	10.2 (0.005)	20.2 (p= 0.014)
Married	65.7 (p= 0.004)	62.8 (p= 0.009)	45.7 (p= 0.018)
Widowed	5.8 (p= 0.002)	24.5 (p= 0.008)	31.6 (p= 0.015)
Divorced	2.2 (p= 0.001)	2.5 (p= 0.002)	2.5 (p= 0.005)
Currently attending school (aged 6-14 years) (percentage)	90.1 (p= 0.005)	69.8 (p= 0.041)	47.7 (p= 0.077)
Education completed (percentage)			
None/preschool	14.2 (p= 0.004)	35.2 (p= 0.011)	49.2 (p= 0.020)
Primary	52.3 (p= 0.005)	47.4 (p= 0.009)	38.5 (p= 0.020)

	Persons without disability	Persons with disability	Persons with severe disability
Secondary	29.5 (p= 0.006)	16.3 (p= 0.007)	11.6 (p= 0.011)
Higher	4.0 (p= 0.002)	1.1 (p= 0.002)	0.8 (p= 0.002)
Education (years)	4.8 (p= 0.059)	3.1 (p= 0.080)	2.3 (p= 0.123)
Household size (members)	5.5 (p= 0.039)	5.1 (p= 0.068)	5.2 (p= 0.106)
Wealth index per capita (percentage)			
Poorest	20.7 (p= 0.009)	24.9 (p= 0.014)	26.5 (p= 0.018)
Poorer	21.6 (p= 0.006)	18.6 (p= 0.010)	18.4 (p= 0.015)
Middle	23.5 (p= 0.007)	22.9 (p= 0.011)	24.0 (p= 0.021)
Richer	18.9 (p= 0.008)	18.8 (p= 0.012)	17.5 (p= 0.017)
Richest	15.3 (p= 0.006)	14.7 (p= 0.010)	13.6 (p= 0.013)
Household identified in IDPoor programme	20.9 (p= 0.007)	26.6 (p= 0.012)	29.1 (p= 0.020)
Residence (percentage)			
Rural	83.8 (p= 0.006)	85.4 (p= 0.010)	83.4 (p= 0.016)
Urban	16.2 (p= 0.006)	14.6 (p= 0.010)	16.6 (p= 0.016)
Observations (number)	60 558	5 555	1 250

4.3 HEALTH STATUS AND HEALTH CARE UTILIZATION OF PERSONS WITH AND WITHOUT DISABILITIES

The proportion of persons with disabilities who reported being ill or injured in the last 30 days was approximately 2.5 times higher than persons without disabilities (26% versus 11%; see Table 3). The ratio increased to three times higher among persons with severe disabilities (33% versus 11%). Not only were persons with disabilities more likely to be sick or injured, the degree of severity of the reported health condition was more likely to be higher. Among persons reporting being ill or injured, persons with disabilities were significantly less likely to report a slight condition (24% versus 45%) and significantly more likely to report a severe condition (19% versus 8%) than those without disabilities. Once again, inequalities were greater among people with severe disabilities, with approximately one third of reported health conditions classified as severe.

Persons with disabilities were 2–3 times more likely to have sought treatment or advice in the last month, depending upon the degree of disability, than those without disabilities (24% and 31% versus 10%). On average, persons with disabilities also reported a relatively higher number of treatment or advice contacts. Among those who were ill or injured, there was little difference in utilization rates across disability status. The vast majority of persons with disabilities had sought treatment or advice for their illness or injury in the past 30 days, at a rate slightly lower than those without disabilities (92% versus 96%; see Table 3). The number of treatment or advice contacts was also similar across subpopulations.

There are significant differences in the type of health care providers sought between persons with and without disabilities, as illustrated in Fig. 4. Across all subpopulations, private pharmacy/drug vendor and private clinics represented the most common sources of treatment or advice, with little difference in the contact rate by disability status. Persons with disabilities were relatively more likely to have a trained health worker or nurse visit them and relatively less likely to visit the office of a trained health worker or nurse. They were also more likely to use a public hospital and less likely to visit a public health centre. This is particularly the case for persons with severe disabilities, of whom among those seeking treatment, 21% had a home visit and 15% had a public hospital visit, compared with 16% and 9% of persons without disabilities respectively.

Depending upon the degree of disability, persons with disabilities on average spent 3–4 times the amount on total health-care-related treatment and travel costs, compared to persons without disabilities over the last month (US\$ 10.3 and US\$ 13.5 versus US\$ 3.1; see Table 3). Among persons who sought health care treatment or advice, those with disabilities paid approximately US\$ 10, or one third more, on treatment-related costs than persons without disabilities in the last month (US\$ 37.3 versus US\$ 27.7). Travel costs were approximately double for persons with disabilities who sought care (US\$ 6.3 versus US\$ 3.4). Treatment and compared travel costs do not appear to differ greatly by the severity of disability among persons seeking treatment or advice.

Fig. 5 illustrates mean health expenditure incurred at different health care providers among persons who sought care. Persons with disabilities are spending more than those without disabilities at private pharmacies or drug vendors and private clinics, which represent the two most commonly sought providers. Specifically, persons with disabilities are spending approximately one quarter more at private clinics (US\$ 50 versus US\$ 41) and double at private pharmacies or drug vendors (US\$ 18 versus US\$ 9) compared to persons without disabilities. Persons with severe disabilities spend one half more than those without disabilities at private clinics (US\$ 61 versus US\$ 41). Higher expenditures are also recorded by disability status at private hospitals and “other” health providers including traditional and other providers. However, the proportion of persons reporting contact at these providers is low, and expenditures for the disabled population are not estimated with statistical precision, as reflected by high standard errors.

A higher proportion of persons with disabilities lived in a household that had received a Health Equity or priority access card than those without disabilities (21%–24% versus 17%; see Table 3). The cards were distributed through the IDPoor programme, with approximately 80% of persons in households identified in this programme provided with a card irrespective of disability status. Higher insurance coverage is reflected in a slightly higher proportion of persons with disabilities seeking care reporting having received free treatment than those without disabilities (11% versus 8%). The vast majority of persons seeking treatment or advice reported paying money, with little difference by disability status, which suggests that insurance did not provide universal coverage of services.

Fig. 6 displays the health care financing mechanisms adopted by persons who had sought treatment or advice in the past 30 days. The most popular mechanism for all subpopulations was self-financing through personal income. Persons with disabilities were significantly more likely to rely upon financial support from relatives for health-care-related expenditures, with 33% of those with disabilities drawing upon this financing mechanism compared with 12% of those without disabilities. The proportion increased to 42% among persons with severe disabilities. Persons with disabilities were also relatively less likely to draw upon personal income and savings. The proportion of people adopting alternative coping mechanisms including undertaking loans, selling assets and the Health Equity Fund, was relatively low, with little variation across disability status.

Table 3. Health and health care utilization indicators in past 30 days, by disability status

	Persons without disability	Persons with disability	Persons with severe disability
Health status indicators			
Ill or injured (percentage)	10.5 (p= 0.002)	26.2 (p= 0.007)	32.9 (p= 0.021)
Severity of illness/injury (percentage)			
Slight	44.5 (p= 0.011)	24.1 (p= 0.014)	17.7 (p= 0.022)
Moderate	47.1 (p= 0.010)	56.8 (p= (0.017)	49.6 (p= 0.032)
Severe	8.4 (p= 0.005)	19.1 (p= (0.012)	32.8 (p= 0.030)
Treatment-seeking behaviour (percentage)			
Sought treatment or advice	10.0 (p= 0.002)	23.9 (p= 0.007)	30.8 (p= 0.0020)
Number of treatment or advice contacts (contacts)	12.9 (p= 0.002)	33.2 (p= 0.0012)	43.7 (p= 0.030)
Sought treatment or advice (if ill or injured)	95.5 (p= 0.004)	91.5 (p= 0.010)	93.6 (p= 0.015)
Number of treatment or advice contacts (if ill or injured) (contacts)	1.2 (p= 0.015)	1.3 (p= 0.010)	1.3 (p= 0.015)
Health expenditures (US\$)			
Treatment	2.8 (p= 0.090)	8.8 (p= 0.709)	11.5 (p= 1.262)
Transport	0.3 (p= 0.019)	1.5 (p= 0.228)	2.0 (p= 0.471)
Total	3.1 (p= 0.098)	10.3 (p= 0.867)	13.5 (p= 1.397)
Social health protection (percentage)			
Health equity or priority access card through IDPoor programme	17.0 (p= 0.006)	21.0 (p= 0.011)	24.0 (p= 0.019)
Free treatment (if sought health care)	7.7 (p= 0.005)	11.0 (p= 0.012)	8.2 (p= 0.018)
Paid money (if sought health care)	93.2 (p= 0.005)	91.7 (p= 0.010)	93.6 (p= 0.015)
In kind/don't know (if sought health care)	0.8 (p= 0.002)	0.1 (p= 0.004)	0.1 (p= 0.006)

Fig. 4 Source of health condition treatment or advice in past 30 days, by disability status

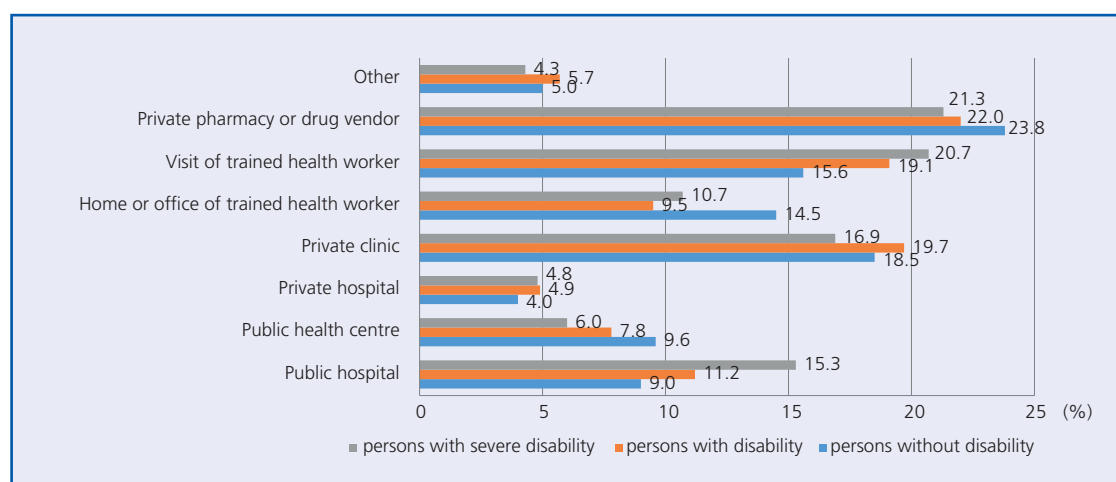


Fig. 5 Health expenditures at source of health condition treatment or advice in past 30 days, by disability status

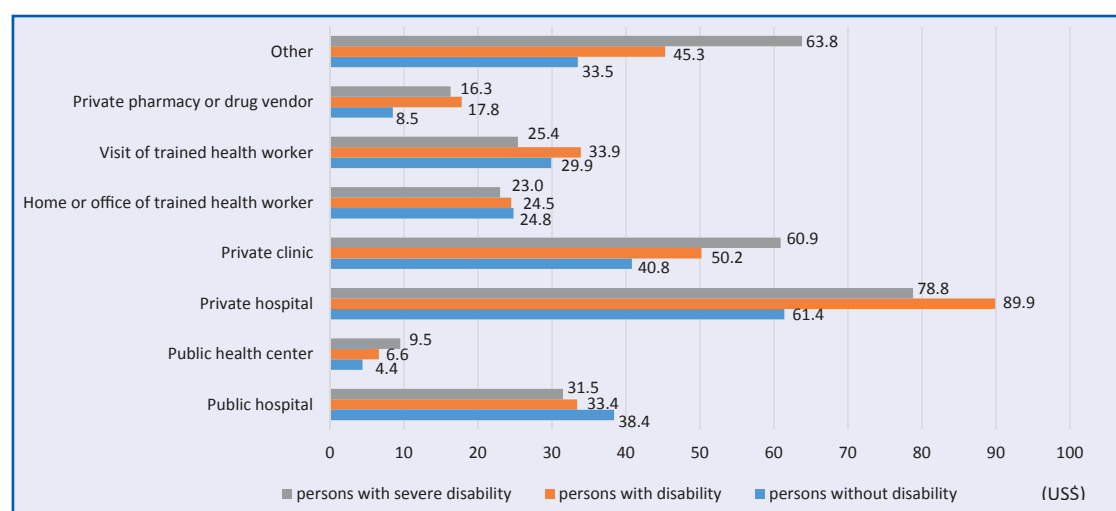
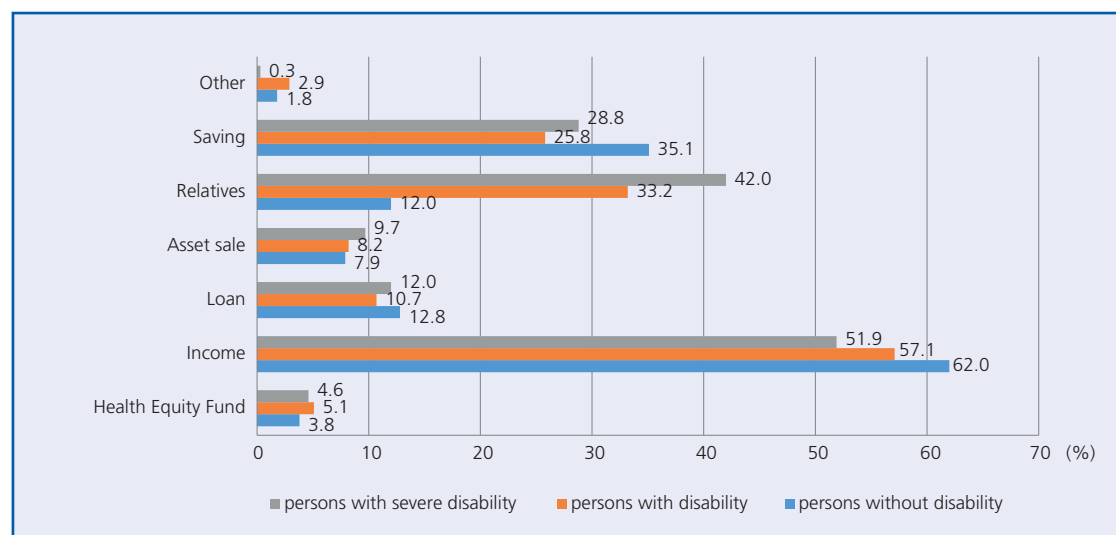


Fig. 6 Health care financing mechanisms, by disability status



4.4 HEALTH STATUS AND HEALTH CARE UTILIZATION OF PERSONS WITH AND WITHOUT DISABILITIES LIVING IN RURAL AND URBAN AREAS

Persons with disabilities in urban areas are more likely to have reported being ill or injured in the last 30 days than those with disabilities in rural areas (31% versus 25%) at a rate greater than persons without disabilities (10% versus 13%; see Table 4). The distribution of the degree of illness or injury reported by persons with disabilities is similar between rural and urban areas. Among persons without disabilities, however, those in urban areas are significantly more likely to report mild conditions than those in rural areas. Differences in degree of illness by disability status therefore are greater in urban than in rural areas.

Persons with disabilities in urban areas are more likely to have sought treatment in the past 30 days than persons with disabilities in rural areas (30% versus 23%) at a rate greater than persons without disabilities (10% versus 12%). This pattern is consistent for the number of treatment or advice contacts across the population. Among persons who were ill or injured, those with disabilities in rural areas were slightly less likely to seek care than persons without disabilities (91% versus 95%), whereas in urban areas the contact rate among the sick was similar by disability status (95–96%). The average number of health care contacts was similar among the ill or injured by disability status, with slightly higher rates observed in urban than in rural areas.

Fig. 7 illustrates the type of health care providers sought by persons with and without disabilities living in rural and urban areas. Use of private pharmacies/drug vendors and private clinics is higher among persons living in urban versus rural areas. However, the use of public health centres is higher among persons living in rural versus urban areas, for persons both with and without disabilities. Public hospital use is slightly higher among persons in urban than in rural areas. There is little difference in the use of private clinics and pharmacies between persons with and without disabilities living in rural and urban areas. Persons with disabilities living in urban areas are more likely to use public health centres than those without disabilities in urban areas, and persons with disabilities in rural areas are more likely to use public hospitals than those without disabilities in rural areas.

Persons with disabilities, on average, spent US\$ 2 more on health-care-related expenses in urban than in rural areas (US\$ 12 versus US\$ 10), whereas persons without disabilities spent similar amounts across locations (about US\$ 3; see Table 4). Most of the expenditure differences can be attributed to higher treatment-related costs, with the travel expenditures remaining similar across rural and urban areas. Among the subpopulation of persons with disabilities who sought health care, expenditures were similar across rural and urban areas, with persons with disabilities reporting slightly higher expenditures in rural than in urban areas – a pattern consistent with persons without disabilities. Note, however, the standard errors of expenditure estimates among persons with disabilities are relatively high, which suggests some degree of statistical imprecision.

Fig. 8 presents health expenditures incurred at selected health care providers by persons with and without disabilities living in urban and rural areas. There is little difference in expenditures at private pharmacies and drug vendors between persons with disabilities living in urban or rural areas, at a rate approximately double that of persons without disabilities. Private clinic expenditures are also higher for persons with disabilities living in urban and rural areas compared to their counterparts without disabilities, with persons with disabilities living in urban areas spending more at private clinics than those with disabilities living in rural areas. A similar pattern exists at public clinics, with persons with disabilities in both rural and urban areas spending more than their counterparts

without disabilities, whereas at public hospitals persons with disabilities living in rural or urban locations are spending relatively less.

A higher proportion of persons with disabilities in rural areas were living in households identified as poor through the IDPoor programme and eligible for a Health Equity or priority access card compared to urban areas (23% versus 15%), at a rate consistently higher (4–5%) than those without disabilities across both rural and urban areas (Table 4). The proportion of persons with disabilities who reported receiving free health care was double in rural versus urban areas, yet remained a small fraction of the total number of persons who sought care (12% versus 6%). The proportion of persons without disabilities seeking care who reported receiving free treatment was similar across rural and urban areas (8–9%). There was little difference in the proportion of persons who sought care reporting having paid money out of pocket, by disability status and location of residence.

Table 4. Health and health care utilization indicators in past 30 days, by disability status and location of residence

	Rural		Urban	
	Persons without disability	Persons with disability	Persons without disability	Persons with disability
Health status indicators				
Ill or injured (percentage)	10.1 (p= 0.002)	25.3 (p= 0.008)	13.0 (p= 0.006)	31.4 (p= 0.017)
Severity of illness/injury (percentage)				
Slight	40.0 (p= 0.012)	23.6 (p= 0.015)	64.1 (p= 0.019)	26.3 (p= 0.024)
Moderate	50.9 (p= 0.011)	56.5 (p= 0.019)	31.4 (p= 0.017)	58.4 (p= 0.028)
Severe	9.3 (p= 0.06)	20.0 (p= 0.014)	4.6 (p= 0.006)	15.3 (p= 0.021)
Treatment-seeking behaviour (percentage)				
Sought treatment or advice	9.6 (p= 0.002)	22.9 (p= 0.007)	12.0 (p= 0.006)	29.8 (p= 0.017)
Number of treatment or advice contacts (contacts)	12.1 (p= 0.003)	31.6 (p= 0.013)	16.9 (p= 0.011)	42.5 (p= 0.951)
Sought treatment or advice (if ill or injured)	95.4 (p= 0.005)	90.7 (p= 0.011)	96.2 (p= 0.005)	95.1 (p= 0.015)
Number of treatment or advice contacts (if ill or injured)	1.2 (p= 0.015)	1.2 (p= 0.030)	1.3 (p= 0.040)	1.3 (p= 0.062)
Health expenditures (US\$)				
Treatment	2.7 (p= 0.101)	8.5 (p= 0.803)	2.9 (p= 0.184)	10.6 (p= 1.230)
Transport	0.3 (p= 0.019)	1.5 (p= 0.259)	0.4 (p= 0.058)	1.7 (p= 0.382)
Total	3.0 (p= 0.110)	10.0 (p= 0.992)	3.3 (p= 0.200)	12.3 (p= 1.248)
Social health protection (percentage)				
Health equity or priority access card through IDPoor programme	18.8 (p= 0.007)	22.5 (p= 0.012)	9.2 (p= 0.012)	14.6 (p= 0.026)

	Rural		Urban	
	Persons without disability	Persons with disability	Persons without disability	Persons with disability
Free treatment (if sought health care)	7.7 (p= 0.005)	11.7 (p= 0.014)	7.8 (p= 0.011)	5.8 (p= 0.014)
Paid money (if sought health care)	93.1 (p= 0.005)	90.8 (p= 0.012)	93.5 (p= 0.009)	95.6 (p= 0.012)
In kind/don't know (if sought health care)	8.0 (p= 0.002)	1.1 (p= 0.004)	5.0 (p= 0.021)	1.2 (p= 0.007)

Fig. 7 Source of health condition treatment or advice in past 30 days, by disability status and location of residence

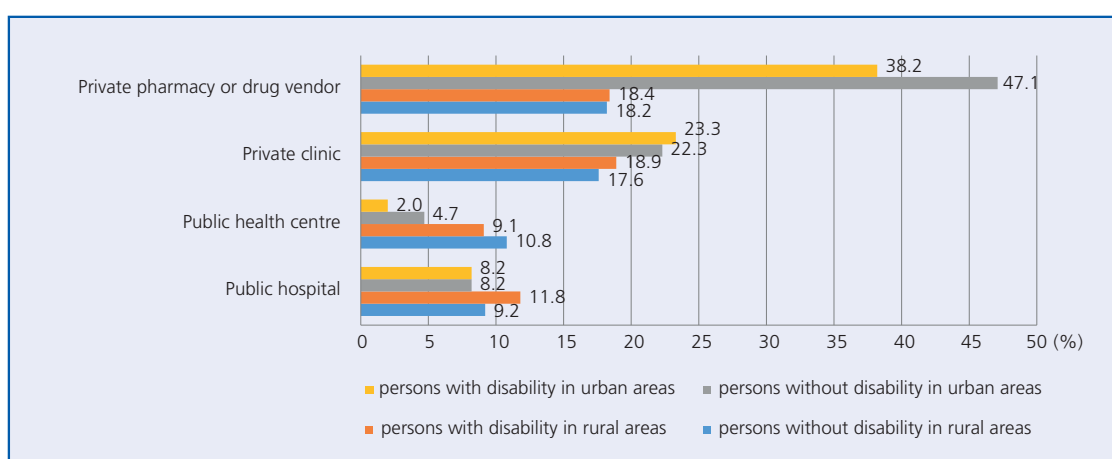
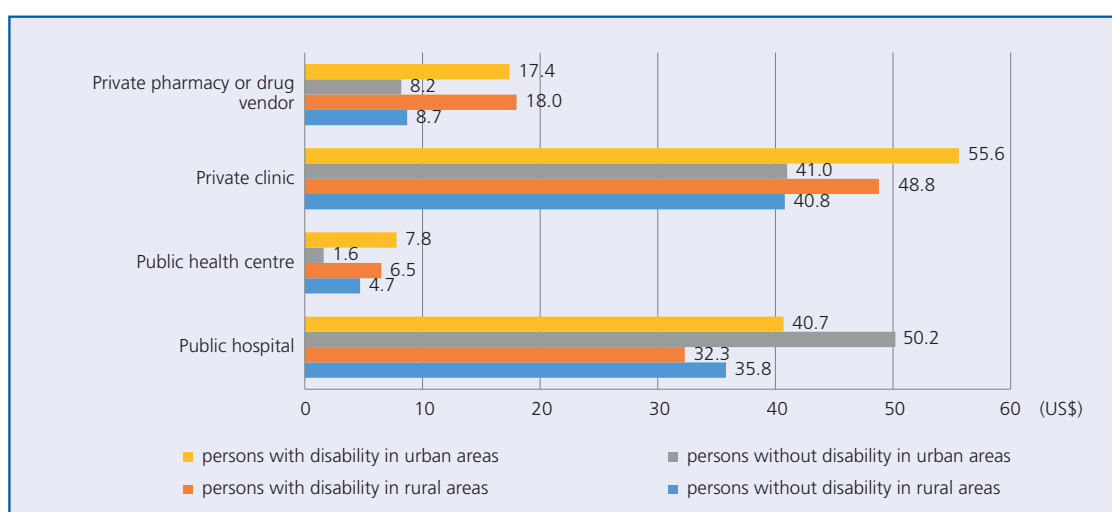


Fig. 8 Health expenditures at source of health condition treatment or advice in past 30 days, by disability status and location of residence



4.5 MULTIVARIATE ANALYSIS OF HEALTH CARE UTILIZATION OF PERSONS WITH AND WITHOUT DISABILITIES

The preceding results present the difference in means for health care utilization outcomes between persons with and without disabilities. However, as illustrated in Table 2, persons with and without disabilities differ in many underlying demographic and socioeconomic characteristics. To describe and isolate the relationship between disability and health care utilization effectively, it is necessary to account for differences relating to age, education and wealth, which are also known determinants of the use of health care. In this instance, we use a statistical technique known generally as multivariate regression to identify the association between disability and health care utilization, whilst holding other influencing factors constant.

Regression modelling of health care utilization is made difficult by problems associated with the mass of zero use and the highly skewed nature of health expenditures (Jones, 2000). To account for these difficulties, modelling is typically undertaken in two parts (known as the two-part model; see Belotti, Deb & Manning, 2015). The first part models the probability of using health care, whereas the second models the level of health care expenditure subject to the use of health care. In our case, the outcome variable for the first part of the model is the probability of seeking treatment or advice in the past 30 days. The second part models the level of total health expenditure for those who sought treatment or advice in the past 30 days. The first part is estimated using a probit model and the second is estimated using a generalized linear model with gamma distribution and log-link. The generalized linear model framework is most commonly applied and recommended in the literature above ordinary least squares estimation, due to complexities associated with the retransformation from the log into the raw scale (Belotti, Deb & Manning, 2015). In both model parts, the coefficients are presented as average marginal effects.³

In Table 5, we predict the probability of seeking treatment or advice by disability status and interaction with key variables of interest. Persons with disabilities on average have a 16.9% chance of using health care, compared with 10.6% for persons without disabilities when keeping everything else constant, representing an increased probability of 6.3%. The chance increases to 19.9% for persons with severe disabilities, versus 11.1% for persons without severe disabilities, representing a difference of 8.8%. For gender comparisons, females with disabilities are on average 5.6% more likely to seek health care than females without disabilities. However, males with disabilities are on average 7.1% more likely to seek health care than males without disabilities. The differences indicate that the effect of disability does differ by gender, with a 1.5% stronger effect for females. Regarding the location of residence, the effect of disability is 0.7% larger in rural than in urban areas (7.0% versus 6.2%). As for poverty status, there is no statistically significant difference in the effect of disability for poor persons versus non-poor persons (6.4% versus 6.4%).

The effect of disability on the chance of using health care is also likely to differ according to the age of the person. In Fig. 9, we plot the predicted probability of health care use for persons with and without disabilities over the life cycle. For both groups, the distribution follows a non-linear U-shape, with higher predicted probability of use at a young age, declining through to middle age, before rising sharply into older age. We observe that those with disabilities have a higher probability of accessing health care treatment and advice than persons without disabilities at all ages, with the gap narrowing over the life cycle (Fig. 9a). This indicates that the effect of disability on the likelihood of using health care declines over age, as clearly depicted in Fig. 9b.

³ A marginal or incremental effect measures the effect on the (conditional) mean of the health care utilization outcome of a change in one of the variables of the model, holding other variables constant (Cameron & Trivedi, 2009).

Table 5. Predicted probability of seeking treatment or advice by disability status and interaction

	Mean	S.E.
Persons without disability	10.6	(0.002)
Persons with any disability	16.9	(0.006)
Difference	6.3***	(0.007)
Persons without disability	11.1	(0.002)
Persons with moderate to severe disability	19.9	(0.017)
Difference	8.8***	(0.017)
Female (persons with versus without disability)	5.6***	(0.006)
Male (persons with versus without disability)	7.1***	(0.007)
Difference	1.5***	(0.002)
Urban (persons with versus without disability)	6.2***	(0.007)
Rural (persons with versus without disability)	7.0***	(0.007)
Difference	0.7***	(0.002)
Poor (persons with versus without disability)	6.4***	(0.007)
Non-poor (persons with versus without disability)	6.4***	(0.007)
Difference	-0%	(0.001)

Note:

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

In Table 6, we predict the probability of health expenditure over the population by disability status and interaction with key variables of interest. For predicted health expenditure, we present the combined two-part model predictions averaged over the population, calculated by multiplying predictions from each part of the model (Belotti, Deb & Manning, 2015). We present the predicted health expenditure effects in dollar amounts over the population, as distinct from semi-elasticities over the population that sought treatment in Table 5. We use the Stata user-written command, *twopm*, which enables us to take account of the complex survey design (Belotti, Deb & Manning, 2015).

In Table 6, persons with disabilities are on average predicted to spend US\$ 6.2 per month on health-related items, versus US\$ 3.3 for those without disabilities when holding fixed other influencing factors. This represents a positive difference of US\$ 3. The predicted spending difference increases to US\$ 4.1 for persons with severe disabilities. Across the genders, disability has a slightly higher spending effect among males compared with females (US\$ 0.69 per month), whereas there are no statistically significant spending effects of disability by urban/rural and poverty status. In Fig. 10, we plot the two-part model of combined expenditures for persons with and without disabilities over the life cycle. At all age levels, persons with disabilities spend more on average on health care than do their counterparts without disabilities. However, the gap increases with age, which indicates that the effect of disability on health spending increases over the life cycle, as depicted in Fig. 10b.

Table 6. Predicted probability of health expenditures (US\$) by disability and interaction

	Mean (in US\$ per month)	S.E.
Persons without disability	3.327	(0.112)
Persons with any disability	6.283	(0.517)
Difference	2.956***	(0.535)
Persons without disability	3.616	(0.120)
Persons with moderate to severe disability	7.710	(0.782)
Difference	4.094***	(0.795)
Female (persons with versus without disability)	2.602***	(0.477)
Male (persons with versus without disability)	3.290***	(0.598)
Difference	0.688***	(0.193)
Urban (persons with versus without disability)	2.945***	(0.533)
Rural (persons with versus without disability)	3.031***	(0.568)
Difference	0.086	(0.183)
Poor (persons with versus without disability)	3.059***	(0.557)
Non-poor (persons with versus without disability)	2.815***	(0.497)
Difference	-0.245	(0.163)

Note:

Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Fig. 9 Predicted probability of seeking treatment or advice and marginal effects over the life cycle, by disability status

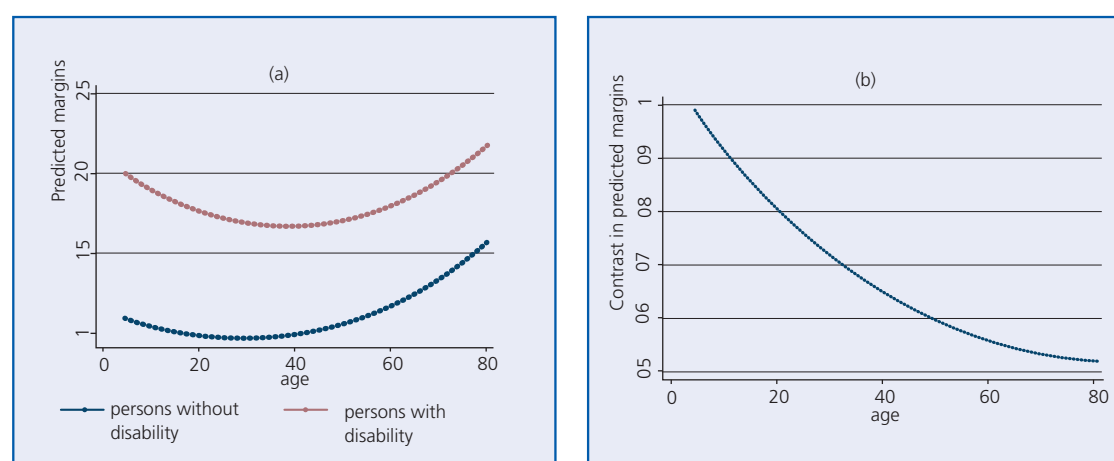
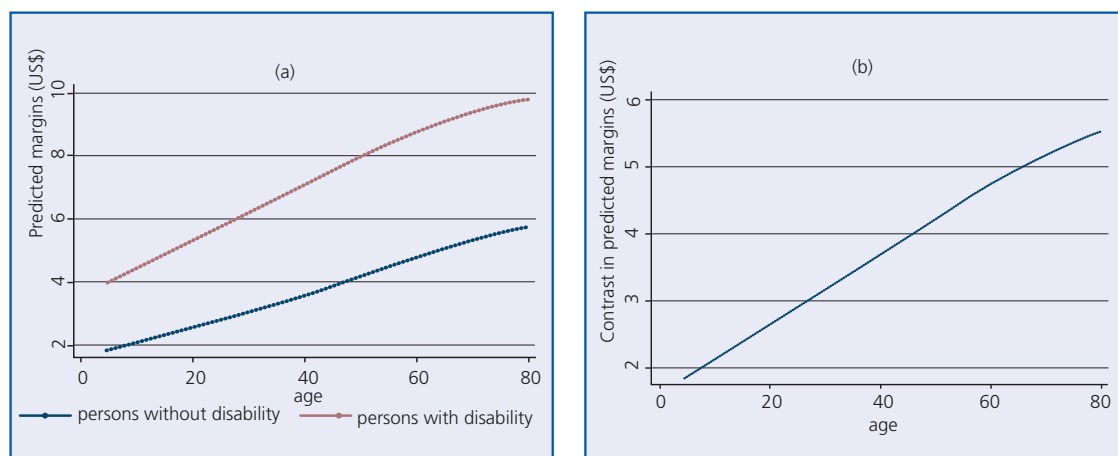


Fig. 10 Combined two-part model of predicted health expenditure and marginal effects over the life cycle (past 30 days), by disability status



5.1 DISABILITY PREVALENCE

Disability prevalences of 9.5% for any level of functioning difficulty and 2.1% for a severe level of functioning difficulty returned from the 2014 Cambodia Demographic and Health Survey (CDHS) are based upon the Washington Group Short Set of Questions on Disability (six questions). This is an internationally standardized measure of disability. The result is low by international comparison. Neighbouring Viet Nam, for example, using the same measure in a 2006 nationally representative household survey, returned respective disability prevalence rates of 15.7% and 3.6% (Mont & Nguyen, 2011). Zambia, another lower-middle-income country, returned national disability prevalence rates of 14.5% and 8.5% respectively using the same measure (Loeb, 2015).

One possible explanation for the relatively low reported disability prevalence in Cambodia relates to the unique demographic profile of the country. The proportion of middle-aged people in the current population, representing the birth cohorts in the 1970s during the height of the civil conflict and genocide period, is lower than expected under normal population growth models (National Institute of Statistics, Directorate General for Health & ICF International, 2015). Approximately one half of the population is under the age of 20 years and just one in 20 is 65 years of age or older (National Institute of Statistics, Directorate General for Health & ICF International, 2015). Since disability is strongly correlated with age, excess mortality during the conflict period downwardly influences current disability prevalence. Other possible reasons for the underreporting of disability are discussed in Section 5.5. The Washington Group's recommended cut-off point to define the population of persons with disabilities is persons with at least one of the six domains coded as "a lot of difficulty" or "cannot do it at all". This is the cut-off that we adopt for what we term the "severe functioning" measure. We elect to use two disability measures in the analysis, a broad disability measure reflecting moderate to severe functioning difficulty and a severe measure so as to compare health care utilization across different levels of functioning. We also do so for the practical reason of insufficient numbers of persons reporting severe functioning difficulties to perform analyses with statistical precision.

Consistent with other countries, disability prevalence in Cambodia is highly correlated with age, with the rate rising rapidly in middle and older age. The level of functional limitation also deepens with age, with the rate of severe disability rising in higher relative proportion in older years compared with other age categories. Disability prevalence among children is notably low, at 1.8% for the broad measure and 0.5% for the severe measure. The Washington Group Short Set of Questions on Disability are not designed to capture functioning limitations in children, which is why the cut-off of 5 years is applied, and arguably could be higher. The expectations of what children can do change significantly over their development and are very culturally specific (UNICEF Pacific & Vanuatu National Statistics Office, 2014). Furthermore, activities such as the ability to socialize and complete a task are important in identifying developmental disabilities in children, and these are not included in the Washington Group

Questions. For these reasons, a specific child disability survey has recently been developed by UNICEF and the Washington Group, and the prevalence results in this report should be viewed with caution.

Prevalence is also highly variable by type of disability reported, consistent with other countries. The pattern is the same as that observed in neighbouring Viet Nam for any level of functioning difficulty, with vision difficulties most commonly reported and self-care difficulties least commonly reported (Mont & Nguyen, 2011). Over the life cycle, the composition of disability changes. Remembering and concentrating difficulties are highly prevalent in persons below working age, which are overtaken by vision and mobility difficulties in old age. This mix also changes somewhat with the level of disability. Communication difficulties become relatively more prevalent among persons below working age, who report severe levels of difficulty. These findings as to the changing nature of disability and needs over the life cycle have important implications for the design and allocation of disability service provision. Appendix Table A1 provides a breakdown of prevalence rates by age category, functional limitation category and level of difficulty.

5.2 SOCIOECONOMIC INEQUALITIES

The socioeconomic profile of persons with disabilities in Cambodia is similar to what is observed in other countries. Persons with disabilities are on average older, with a higher proportion of females and unmarried people. They have lower educational achievements, and experience higher levels of poverty, as measured by an index of household durable assets, housing characteristics, and access to water and sanitation services. The inequalities are higher among those reporting higher levels of functional difficulty, consistent with other findings in the literature.

The starkest inequalities relate to education, as measured by several measures including current enrolment ratio, highest level of education achieved, and number of years of education completed. Approximately half of children aged 6–14 years with severe disabilities attended school in the current school year, compared with 90% of children without disabilities. Among the all-aged sample, 50% of persons reporting a severe functioning difficulty had received no formal education, compared with 14% of persons without disabilities. On average, persons with severe disabilities had half the number of completed years of education compared with persons without disabilities. We note further that education and disability status differed significantly by gender for the severe disability measure (results not shown). The relative enrolment ratios for girls and boys with severe disabilities were 30% and 63% respectively, compared with 71% and 68% for the broad disability measure, and 91% and 89% for children without disabilities. The returns to household welfare from education are high in low- and middle-income countries. Hence inequalities relating to educational achievement by disability status in Cambodia are likely to carry intergenerational effects with respect to household poverty (Patrinos & Psacharopoulos, 2010).

The incidence of poverty among persons with disabilities is 4–6 percentage points higher depending upon the measure of poverty, and 6–8 percentage points higher for persons with severe disabilities. We adopt two measures of poverty including the lowest 20% of the distribution of an index of household assets and housing characteristics and households identified by the IDPoor programme. It is encouraging that the two measures return very similar results across the disabled population. However, it is important to state that the measures probably underestimate the extent of poverty experienced by persons with disabilities. The wealth index is a measure of permanent income and therefore does not take account of the short-run or temporary shocks to the household that may be induced by disability (Vyas & Kumaranayake, 2006). Furthermore, the measure is equivalized by the number of persons in the household. Hence it will underestimate the extent of poverty experienced among the population with disabilities if resources are unequally distributed in favour of household members without disabilities – which has been reported in Cambodia (Gartrell, 2010).

5.3 HEALTH STATUS AND HEALTH CARE UTILIZATION INEQUALITIES

The results paint a clear picture that persons with disabilities on average are in poorer health and have higher health care needs, as indicated by higher use of health care and associated expenditures compared to the general population in Cambodia. Once again, inequalities in health and health care usage associated with disability increase with the threshold of disability. These overall findings are consistent with findings from other country studies, including in neighbouring Viet Nam (World Health Organization & World Bank, 2011; Palmer et al., 2012).

Persons with disabilities were more than twice as likely to be ill or injured, report a severe health condition if ill or injured, and seek treatment or advice as persons without disabilities in the last month. Private pharmacies remained the most common source of treatment or advice across all population groups, followed closely by private outpatient clinics, which is a policy concern. The use of public providers at the hospital and community health centre level remains low. Persons with disabilities, and particularly those reporting severe disabilities, were relatively more likely to use public hospitals and relatively less likely to use public health centres than those without disabilities. This may be explained by the need for higher-level health services available at hospitals rather than at the community level. Persons with disabilities were also relatively more likely to have a trained health worker visit them, presumably due to mobility and accessibility barriers associated with their disability (Kleinitz et al., 2012).

Persons with disabilities spent on average 3–4 times the amount on total health-care-related treatment and travel costs compared to persons without disabilities over the last month, depending upon the degree of disability. At health care providers, they spent approximately 30% more, and twice the amount on associated travel. Persons with disabilities spent approximately double what those without disabilities spent at private pharmacies or drug vendors, and 25–50% more at private clinics, depending upon the degree of disability. Together, these represent the most commonly sought providers, and this probably goes a long way in explaining the differences in treatment expenditures. Expenditures associated with home visits by health workers and public hospital visits on average do not differ by disability status. However, utilization rates of these services are higher among persons with disabilities, which will also contribute to treatment expenditure differences. Higher travel expenditures may be explained by the fact that persons with disabilities are less likely to consult community-level public services and/or must hire transport, specialized or otherwise.

The level of health insurance coverage is 4–7 percentage points higher among persons with disabilities, as provided under the IDPoor programme, which targets households living in conditions of poverty. Higher insurance coverage among persons with disabilities reflects the earlier result that they are disproportionately poor. We cross-check the receipt of a health insurance card against the second poverty measure based upon the constructed wealth index and find that 65% of recipients are poor, which suggests a reasonable level of targeting. Over 80% of persons in households identified in the IDPoor programme received a health insurance card, which indicates furthermore that implementation of the programme is reasonably efficient.

In spite of a higher proportion of persons with disabilities indicating that they had received free treatment at facilities in the past month, the vast majority reported having paid the same rate as those without disabilities. This suggests that the scope of insurance coverage is limited. The data on health financing also support this, with only approximately 5% of persons with and without disabilities relying upon the health insurance card (Health Equity Fund) to finance treatment and related travel expenditure. Those with disabilities were less likely to draw upon income and savings, and significantly more likely to draw upon support from relatives to finance health expenditure. This finding suggests that persons with disabilities have a lower capacity to pay for health care due to higher levels of poverty and/or health care needs.

5.4 RURAL/URBAN INEQUALITIES IN HEALTH STATUS AND HEALTH CARE UTILIZATION

Persons with disabilities living in rural and urban areas report relatively worse health status and a higher level of health care utilization than their counterparts without disabilities. However, there are some interesting and unexpected differences between the health and health care behaviours of persons with disabilities in rural and urban areas.

Those with disabilities in urban areas were 7% more likely to seek treatment than those in rural areas. This may be explained by several factors, including a higher proportion of the urban population reporting being ill or injured than those in rural areas, and a higher proportion of private pharmacies/drug vendors and private clinics available, which represent the two most commonly sought providers. Persons with disabilities in rural areas were approximately five times more likely to use public health centres than those with disabilities in urban areas, which may reflect any number of factors, with lower capacity to pay and relative affordability of public health centres services being the most likely explanations (Kleinitz et al., 2012).

At the population level, on average, persons with disabilities in urban areas spent 20% more than those living in rural areas. This can again be attributed to the higher relative proportion of reported sickness and use of private health care providers. Among persons with disabilities who used health care, there was surprisingly little difference in total expenditure between those living in rural and urban areas. This may be explained by offsetting higher use of public health centres and hospital facilities among persons in rural areas – particularly the latter, which are associated with high expenditures. Another interesting finding relates to the small difference in travel expenditure between persons with disabilities living in urban and rural areas who sought care. This result suggests that persons with disabilities in rural areas do not travel to urban areas to seek care, perhaps due to financial, service quality, accessibility and other barriers to accessing health care in Cambodia (Kleinitz et al., 2012).

A higher proportion of persons with disabilities in rural areas were placed on the list of poor households or received a Health Equity or priority access card in rural areas than in urban areas. This was reflected in a higher proportion of persons with disabilities in rural areas reporting having received free treatment. However, the level of social health protection remains low in both rural and urban areas. Less than one quarter of persons with disabilities in rural areas were identified as poor and eligible for free health insurance, and among persons with disabilities who sought care in rural areas, only 12% reported receiving free treatment. Over 90% of persons reported paying out-of-pocket fees for health services.

5.5 MODELLING HEALTH CARE UTILIZATION

For policy purposes, it is useful to know average health care utilization rates across the population, not simply among persons who experienced a health condition and sought treatment. It is useful to know how the health-seeking behaviours differ for the average person with and without disabilities, while holding constant differences in age, education, wealth and other confounding factors. Furthermore, it is useful to know how health-seeking behaviours differ among persons with disabilities, as determined by personal and environmental characteristics such as age, gender, poverty status and location of residence. For these purposes, we adopt an appropriate regression model, the two-part model. Further explanation of this modelling is given in the Appendix.

Disability is associated with a 6–9% increased likelihood of seeking health care treatment or advice and a 16% increase in expenditure at the point of care, when holding other observable factors

constant. The combined increase in expenditure over the population associated with disability is US\$ 2–3 per month, depending upon the level of disability. In other words, persons with disabilities spend on average US\$ 2–3 more per month than equivalent persons without disabilities on health-care-related costs. The estimated marginal effect is low compared to the actual difference observed in the survey data, of approximately US\$ 7, due to the controlling of other factors that are jointly correlated with disability and health care utilization. For example, we know from Table 2 that persons with disabilities are significantly older than persons without disabilities, and that age is a positive and strong predictor of health care utilization. We include in our model a control for age and polynomial of age, both coefficients of which are statistically significant yet do not appear in Table 5 due to difficulties in the estimation and interpretation of the average marginal effect on the polynomial in age (Cameron and Trivedi, 2009).

An important finding from this research is that predicted health care utilization between persons with and without disabilities differs significantly over the life cycle. As illustrated in Fig. 10, at age 5, children with disabilities are approximately 100% (twice) as likely to use health care as a 5-year-old child without disabilities. This gap decreases steadily over the life cycle. Conversely, the expenditure gap for a 7-year-old is about US\$ 2. This rises steadily to approximately US\$ 5 for persons aged 60 years, compared with their peers without disabilities. What these results suggest is that, compared to their peers, younger people with disabilities are utilizing health care more, but are spending less than older people with disabilities. We insert the caveat that our model may not be accurate for persons at either extreme of the age distribution due to the relatively low number of observations with positive health expenditures. This relates particularly to children with disabilities: hence our results on predicted expenditures must be viewed with caution.

The results suggest that the average effect of disability on health care behaviours does differ by gender, with a slightly stronger positive effect among females. This result is somewhat surprising, since women and girls with disabilities are frequently reported to be at a double disadvantage (World Health Organization & World Bank, 2011). Indeed, we find current school enrolment ratios to be significantly lower for girls versus boys with moderate to severe disabilities in Cambodia, so we would expect to see similar disparities in access to health services. We also examined whether average disability effects varied by gender with the moderate and severe disability threshold, and the results held. It may be that disability effects by gender vary over the life cycle. To explore this further, we predicted (with a graph) health utilization marginal effects for disability by gender over the life cycle. We found a consistently stronger effect for females over the life cycle for both the probability and level of health care use. Our results thus do not support the idea that disability and gender effects vary with age. These plots are included in the Appendix (Appendix Figs. A1 and A2).

5.6 LIMITATIONS

The Washington Group Short Set of Questions on Disability contained in the CDHS is not without limitation. The clauses “even when wearing glasses” or “even when wearing a hearing aid” are known to cause confusion among some respondents (UNICEF Pacific & Vanuatu National Statistics Office, 2014). Furthermore, the questions do not address upper body mobility difficulties. Of significance is that they do not identify most psychological issues that are highly prevalent in the Cambodian population due to its recent traumatic history (Schaack, Reicherter & Chhang, 2011). Activities important for identifying developmental disabilities in children are further neglected. There are also linguistic challenges in the translation of the difficulty category “some”, which affect how the other categories “a lot” and “cannot do” are interpreted. The level of disability reported will depend upon survey administration, including the level of interviewer training and how questions are actually asked in the household. Interviewers sometimes assume they know the answers, or are embarrassed to ask. It is important that the question set protocol is followed correctly and that each household member is asked separately.

For these reasons, the extent of disability is likely to be underreported in this survey. Indeed, the returned prevalence of 2.1% for the Washington Group recommended cut-off of persons experiencing “a lot of difficulty” or “cannot do” in at least one of the six domains is low by international comparison. It is lower than anticipated for a low-income country with a history of civil and regional conflict. For this reason, we use the “some difficulty” in any domain measure as an additional measure of disability to ensure an adequate number of observations when disaggregating the data by gender, age categories, urban and poverty status. Our results on the interactions of disability must therefore be viewed with caution, since they do not reflect the recommended threshold of disability and may be only weakly correlated with the health care utilization outcomes.

The results presented in this report describe the association between disability and health care utilization in Cambodia. It is important to acknowledge that they do not describe the causal effect of disability on health care utilization. In our models, we control for observed characteristics in the data that may be jointly correlated with disability and health care utilization, such as age, gender and education level. We simply describe how health care utilization varies with disability status, conditional on these other observable factors. This does not mean that disability has an effect on health care utilization, but rather that health care utilization varies as disability status varies. We therefore model the extent of disability-related inequality in health care utilization. There may also be other factors that are not observed or controlled for in the survey data which are jointly correlated with disability and health care utilization, such as self-confidence and motivation. In this case, our results on the association between disability and health care utilization will be further biased. To correct this bias in cross-sectional data as used here requires the availability of instruments or variables that are correlated with disability but, conditional on this, not health care utilization itself.

6

CONCLUSION AND CONSIDERATIONS FOR POLICY

Our results indicate that persons with disabilities in Cambodia experience higher health care needs than the population without disabilities, consistent with evidence presented from other countries. Persons with disabilities were more than twice as likely to be ill or injured, report a severe health condition if ill or injured, and seek treatment or advice than those without disabilities. Persons with disabilities spent on average 3–4 times the amount on total health-care-related treatment and travel costs compared to persons without disabilities, depending upon the degree of disability. At health care providers, they spent approximately 30% more on treatment and twice the amount on associated travel. This is due largely to higher average expenditures at private pharmacies or drug vendors and private outpatient clinics, which represent the two most commonly sought providers across the population.

When we control for demographic and socioeconomic differences between persons with and without disabilities, such as age, gender and education level, disability maintains a strong positive and statistically significant association with the probability of using health care and the level of health-care-related expenditure. We further find that the effects of disability on health care utilization vary over the life cycle and gender of the person. The effects of disability on the probability of using health care decline with age, whereas the effects of disability on the level of health expenditure increase with age. In other words, disability has a stronger effect on health care seeking at a younger age and a stronger effect on the level of health care expenditure in older age. We find disability to have a stronger impact on health care utilization for females versus males.

In addition to relatively high health care needs, our results indicate that persons with disabilities in Cambodia have a lower capacity to pay for health care than those without disabilities, in line with the burgeoning international literature on disability and poverty (World Health Organization & World Bank, 2011; Mitra, Posarac & Vick, 2013). By two measures of poverty, including a calculated measure of household wealth and participation in the Poor Households (IDPoor) programme, persons with disabilities are approximately 4–6% more likely to be poor. We note that these measures are likely to underestimate the extent of poverty experienced by persons with disabilities. Other results also point to omit economic disadvantage. Persons with disabilities experience significantly lower educational achievements, with approximately half of persons with severe disabilities having completed no formal education and approximately half of children with moderate to severe disabilities not currently attending school. With respect to health care financing, we see further signs of lower relative capacity to pay, with persons with disabilities less likely to draw upon income and savings and more likely to draw upon support from relatives than those without disabilities.

The combination of relatively high health care needs and low capacity to pay among persons with

disabilities represents a serious policy concern for health equity goals of providing access to all the services that people need without causing financial hardship. We find a slightly higher rate of health insurance coverage among persons with disabilities in Cambodia through participation in the IDPoor programme, reflecting the fact that they are disproportionately poor. However, around three quarters of the disabled population remain uninsured and almost all persons with disabilities who sought care incurred out-of-pocket costs. Our regression analysis results were unchanged when we controlled for insurance, which suggests that the average effect of disability is not driven by differences in insurance coverage.

6.1 POLICY CONSIDERATIONS

Under current National Disability Law and strategic plans in Cambodia, persons with severe disabilities who are poor are entitled to preferential health care and social transfer policies. While this is a positive initiative, it is a concern since our results indicate that both the utilization of health care and the capacity to pay for it differ little by the degree of disability, using a measure of moderate to severe disability and severe disability. We do observe higher utilization and poverty among the severely disabled population compared to the population that includes moderate disabilities (referred to throughout the report as “any degree of disability” or “persons with disabilities”) yet the magnitude is small. On health equity grounds, there is a case for persons with both severe and moderate disabilities being eligible for social protection support, irrespective of poverty status. Arguably, the poverty eligibility criterion should be lifted since persons with disabilities incur a range of additional costs, including those relating to health care, to achieve the same standard of living as those without disabilities (Haveman & Wolfe, 2000). When adjusting for the costs of disability, more people with disabilities are pushed below the poverty line (Mont & Nguyen, 2011). This is supported by qualitative research findings in Cambodia, where many disabled participants felt that more people with disabilities should be recognized as being poor and entitled to benefits (Kleinitz et al., 2012).

The Royal Government of Cambodia has the legal and institutional arrangements in place to expand social protection support for persons with disabilities. The Health Equity Fund targets free health insurance at vulnerable households, covering treatment as well as travel-related expenses to which those with disabilities are prone (Annear, 2010). The current benefits package includes travel benefits at the hospital level only. In principle, high-cost treatment services are covered under the benefits package, yet there are implicit and explicit limits in what is covered. This is likely to present a problem for persons with disabilities who often use hospitals. Currently, the Health Equity card is effective only at public health care facilities. However, our results indicate that public facilities are used infrequently compared to private clinics and pharmacies or drug vendors. Increasing insurance coverage among persons with disabilities could facilitate a substitution effect away from less regulated private providers.

A 2011 subdecree of the National Disability Law enacts a disability pension valued at US\$ 5 per month for persons with severe disabilities who are poor to assist with disability-related expenses (Kingdom of Cambodia, 2011). Disability pensions have an important role to play in the financial protection of health expenses that are not covered under health insurance. Specifically, these include ongoing medication needs, private clinic visits, associated travel expenses and doctors’ home visits that those with disabilities need. The value of the current pension is roughly equivalent to the average gap in health expenditure across the population with and without disabilities. However, it covers approximately half the gap in monthly health care expenditure between persons with and without disabilities who use health care. Most of this gap is attributed to increased medication and private clinic expenditure. Consideration should be given to increasing the pension amount commensurate with health care needs. This argument is strengthened by the fact that health care represents just one area of need for persons with disabilities.

The provision of health insurance and income support will assist with financial barriers to accessing health care that are identified in this report and in a qualitative national study as being a key barrier to accessing health services for persons with disabilities in Cambodia. Other policy considerations should be given to addressing nonfinancial barriers to accessing health care among those with disabilities. Quality of care issues are also reported as a significant barrier to health care use among persons with disabilities in the country (Kleinitz et al., 2012). The most commonly cited issues were uncaring attitudes and inadequate knowledge and skills of health professionals, along with shortages in the supply of appropriate services and medications. Raising awareness among health service providers on the rights and needs of persons with disabilities for health care will improve service quality and access. The expansion of disability goods and service markets in the health sector, including improving access to specialized rehabilitation services, assistive devices and medication for those with disabilities nationally will further ensure that they will have increased access to the services that they need.

Another significant barrier to health care utilization among persons with disabilities identified in qualitative research in Cambodia relates to their lack of knowledge of their rights and entitlements to health care (Kleinitz et al., 2012). Many participants with disabilities in the study were unaware of the costs that they would incur in accessing health services at government facilities. Specifically, with regard to identification in the IDPoor programme, they were unaware that the possession of the IDPoor and Health Equity card entitled them to free services and transportation. These findings suggest that more needs to be done to improve understanding and awareness among persons with disabilities on their rights to health care and entitlements under social health protection. Findings presented in this report show significant educational achievement gaps for persons with and without disabilities. The development of inclusive education and special education policies will address user knowledge barriers to health care and improve the capacity to pay for health care for those with disabilities in the longer term.

Physical accessibility barriers to health care were also identified in qualitative research involving persons with disabilities in Cambodia (Kleinitz et al., 2012). Respondents reported that it was common to see health facilities without ramps, accessible toilets, wide doorways and appropriate signage. Where ramps did exist, they were difficult to access, being too steep or too narrow. Persons with disabilities also reported a lack of accessible and reliable transport as a key physical barrier to accessing health facilities. These findings suggest that further efforts are required to improve physical access to health facility infrastructure and transportation systems.

Last, and by no means least, sociocultural issues are identified as considerable barriers to participation of persons with disabilities in Cambodia (Gartrell, 2010; Kleinitz et al., 2012). Persons with disabilities report that they are not encouraged to participate in community events or forums, or family decision-making, due to the shame associated with their disability. Negative social attitudes on the capabilities of persons with disabilities to participate in productive, family and community life have a negative effect on the motivation of those with disabilities to access health care and rehabilitation services. Continued efforts are required to change attitudes and reduce discrimination experienced by persons with disabilities in Cambodian society so as to ensure that they are provided with opportunities to participate as equal and valued members of society.

APPENDIX

TWO-PART REGRESSION MODELLING FOR HEALTH CARE UTILIZATION

The model demonstrates in two separate stages the probability of accessing treatment and the level of expenditure among persons who sought treatment. It is preferred over ordinary estimation techniques to overcome distributional problems associated with a large proportion of people with no health care costs and highly skewed expenditures for those who sought care. In our case, 88% of the sample had zero health expenditure in the last 30 days, with a skewness statistic of 4.45. This indicates that the positive expenditure distribution is far from symmetrical. Ordinary least squares estimation relies upon a continuous distribution, hence estimation will be biased and inefficient (Greene, 1990). For estimation of the two-part model, the Stata user-written command, *twopm*, is used, which allows the complex survey design of the Cambodia Demographic and Health Survey (CDHS) to be taken into account (Belotti, Deb & Manning, 2015). Ignoring the survey design will lead to biased estimates of the population parameters. The regression model results support the average statistics discussed, which do not adjust for observable demographic and socioeconomic differences in underlying population groups.

Table A1. Disability prevalence by age category, functional limitation category and level of functional difficulty

	Seeing	Hearing	Walking	Remembering & concentrating	Self-care	Communicating
Any level of functional difficulty (percentage)						
5–14	0.3	0.5	0.3	0.7	0.6	0.5
15–34	1.0	1.0	0.8	1.6	0.3	0.8
35–59	6.5	2.7	4.4	5.2	0.7	1.2
60+	30.6	17.1	22.2	21.5	6.9	7.9
All-age sample	5.1	2.8	3.7	4.2	1.1	1.5
Moderate to severe level of functional difficulty (percentage)						
5–14	0.1	0.1	0.1	0.2	0.2	0.3
15–34	0.1	0.3	0.2	0.4	0.2	0.5
35–59	0.4	0.4	0.8	0.5	0.3	0.6
60+	5.2	3.1	5.5	3.6	2.9	2.2
All-age sample	0.7	0.6	0.9	0.7	0.5	0.6

Fig. A1 Marginal effects of disability on the predicted probability of seeking treatment or advice over the life cycle (past 30 days), by gender

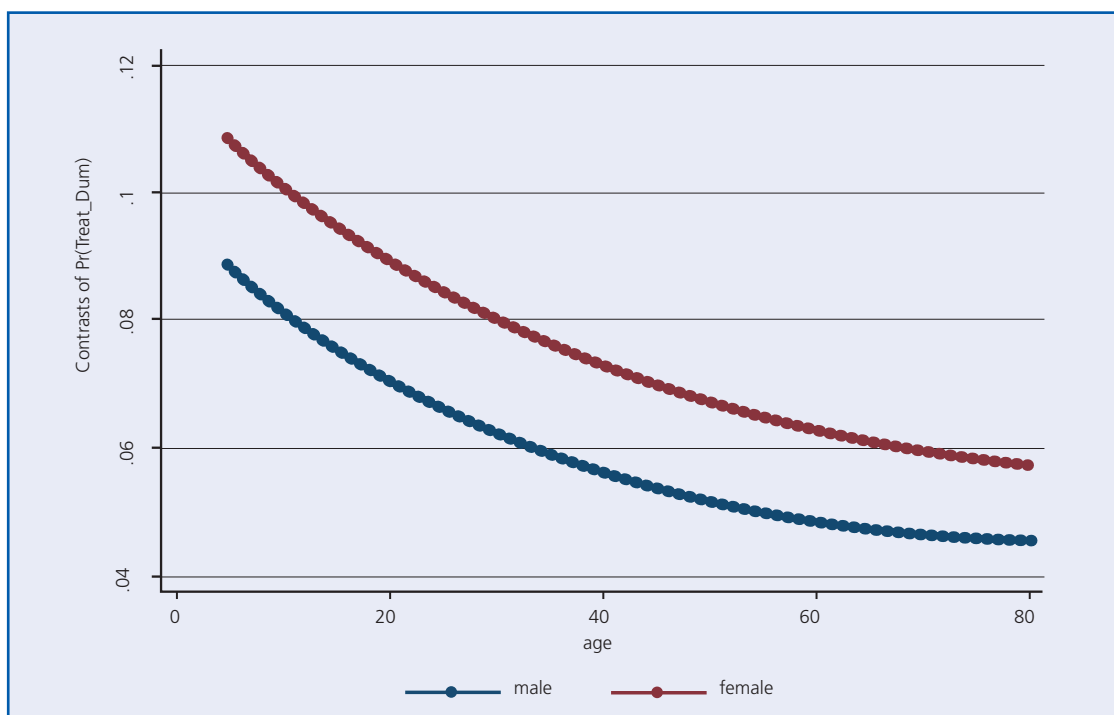
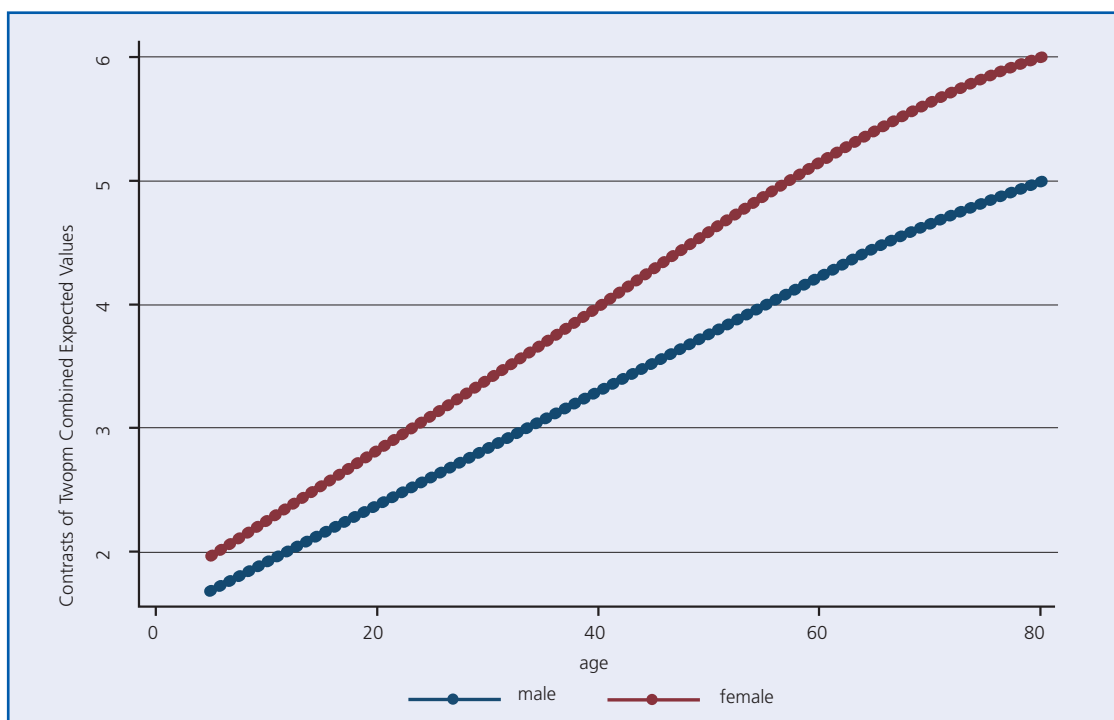


Fig. A2 Marginal effects of disability on the predicted two-part model health expenditures over the life cycle (past 30 days), by gender



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